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ABSTRACT

Standardized vocational education course titles and core contents are provided for two courses in Mississippi: electricity/electronics I and II. The first course contains the following units: (1) orientation, safety, and leadership; (2) basic principles of electricity/electronics; (3) direct current (DC) theory; (4) magnetism and DC motors; (5) alternating current (AC) theory; and (6) soldering. The second course contains the following units: (1) orientation, safety review, leadership; (2) solid state; (3) digital electronics; and (4) residential wiring. Each unit consists of these components: objectives, with core/essential objectives indicated; suggested instructional practices; list of suggested resources; list of evaluation and suggested minimum performance standards, with core/essential objectives indicated; and performance record, with core/essential objectives indicated. A checklist for each course combining all unit performance standards into a single list is included. (NLA)

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STANDARDIZED CURRICULUM

FOR

ELECTRICITY/ELECTRONICS

MISSISSIPPI DEPARTMENT OF EDUCATION

OFFICE OF VOCATIONAL, TECHNICAL

AND ADULT EDUCATION

June 1989

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1989

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FOREWORD

This volume is intended to be used in the State of Mississippi as a mechanism for standardizing vocational education course titles and core contents. The need for standardization of curricula was triggered by provisions in the Educational Reform Act of 1982 which mandated:

-- elimination of nearly all currently existing curriculum requirements and development of new curriculum content that is "properly sequenced" and "coordinated";

-- steps to ensure that students master one level of course work before being advanced to the next level and that progression is properly sequenced;

-- a criterion-referenced, state-wide testing program that is built upon an identified set of "basic skills" keyed to student performance in grades 3, 5, 8, and 11;

-- revised graduation requirements that take into account student performance on the basic skills and also on a test of "functional literacy skills"; and

-- a system of accrediting schools that takes into account the performance of districts, schools, and students.

In addition to the mandates of the Educational Reform Act, the Strategic Plan for Vocational and Technical Education in Mississippi also calls for improving the quality of vocational and technical education through the standardization of curricula and the articulation of secondary and postsecondary programs.

Both of these mandates were further reinforced by legislation passed in 1986 which called for the establishment of state-wide "guidelines and procedures for managing an instructional program in the public schools." This legislation calls for instructional management plans containing the following components:

1. a written list of learning objectives for every course for which academic credit is given on students' transcripts (state specified core objectives must be included);

2. <u>suggested</u> instructional practices and resources for the learning objectives;

3. standards for student performance for each learning objective; and

4. systematic procedures for evaluating student performance on the learning objectives.

Specific local district actions regarding the state-wide instructional management plan are also required, namely:

1. The objectives contained in this document are common to all programs in the state. Core objectives are designated with an asterisk. The local district is encouraged to add additional objectives to this listing to meet local needs of students and employers.

2. The local school board must officially adopt the learning objectives as the district's curricula.

3. Pass/fail policies must be based on mastery of learning objectives.

4. Student performance on the learning objectives must be systematically evaluated at least once during the school year.

5. During the school year, records of individual student performance must indicate whether or not the objectives have been mastered. The record must indicate mastery status for each of the objectives tested in the Basic Skills Assessment Program (including functional literacy skills) and must be permanently maintained on all students who do <u>not</u> master the basic and functional literacy skills prior to being tested on them.

6. Each year, information about student performance on learning objectives must be reviewed. Those objectives which students are not mastering must be identified, and a plan must be developed for improving student performance on those objectives.

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ELECTRICITY/ELECTRONICS I

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ELECTRICITY/ELECTRONICS I

Unit No.	Title
1	Orientation - Safety - Leadership
2	Basic Principles of Electricity/Electronics
3	D. C. Theory
4	Magnetism and D. C. Motors
5	A. C. Theory
6	Soldering

COURSE: Electricity/Electronics I

Unit 1: Orientation - Safety - Leadership (2 weeks)

Objectives: Upon completion of this unit, the student will:

1. State reasons why the electricity/electronics fields are good areas for employment.
2. Identify areas of employment opportunities.
3. Identify responsibilities of students and teachers in the program.
*4. Match terms and definitions associated with electrical safety.
*5. State hazards of working with electrical and electronic equipment.
6. Identify the classes of fire and types of fire extinguishers.
*7. Identify general safety rules.
*8. Identify safety color codes.
9. State procedures of leadership used to reach an agreement in an orderly manner.
10. Select the purposes of VICA.
11. Identify the meaning of voltage and amperage.
12. State minimum amperage that will prove fatal.

*Indicates core/essential objectives

Suggested Instructional Practices:

Lecture - discussion
Laboratory demonstration and practice

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Secondary Resource: VICA Leadership Handbook

Evaluation and Suggested Minimum Performance Standards:

Objective 1: The student will state two reasons why the electricity/electronics fields are good areas for employment.
Objective 2: The student will identify three areas of employment opportunities.
Objective 3: The student will identify four responsibilities of students and three responsibilities of teachers in the program.

*Objective 4: The student will match terms and definitions associated with electrical safety with 100% accuracy.
*Objective 5: The student will state hazards of working with electrical and electronic equipment.
Objective 6: The student will identify four classes of fires and four types of fire extinguishers.
*Objective 7: The student will identify ten general safety rules.
*Objective 8: The student will identify five safety color codes.
Objective 9: The student will state two procedures of leadership used to reach an agreement in an orderly manner.
Objective 10: The student will select five purposes of VICA.
Objective 11: The student will identify the meaning of voltage and amperage with 80% accuracy.
Objective 12: The student will identify the quantity of amperage that will prove fatal at the minimum level at 100% accuracy.

*Indicates core/essential objectives

Performance Record: Place a check by each objective the student achieved:

____ 1. Stated reasons why electricity/electronic fields are good areas for employment.
____ 2. Identified areas of employment opportunities.
____ 3. Identified responsibilities of students and teachers in the program.
____ *4. Matched terms and definitions associated with electrical safety.
____ *5. Stated hazards of working with electrical and electronic equipment.
____ 6. Identified the classes of fire and types of fire extinguishers.
____ *7. Identified general safety rules.
____ *8. Identified safety color codes.
____ 9. Stated procedures of leadership used to reach an agreement in an orderly manner.
____ 10. Selected the purposes of VICA.
____ 11. Identified the meaning of voltage and amperage.
____ 12. Selected minimum amperage that will prove fatal.

* Indicates core/essential objectives

COURSE: Electricity/Electronics I

Unit 2: Basic Principles of Electricity/Electronics (2 weeks)

Objectives: Upon completion of this unit, the student will:

1. Identify terms and definitions associated with the nature of matter.
*2. Describe laws of electrical charges.
*3. Identify materials for conductors, insulators, and semi-conductors.
4. Identify sources of electrical energy.

*Indicates core/essential objectives

Suggested Instructional Practices:

Lecture - discussion

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Evaluation and Suggested Minimum Performance Standards:

Objective 1: The student will identify eight terms and definitions associated with the nature of matter.
*Objective 2: The student will describe two laws of electrical charges.
*Objective 3: The student will identify materials for three conductors, three insulators, and two semi-conductors.
Objective 4: The student will identify two sources of electrical energy.

*Indicates core/essential objectives

Performance Record: Place a check by each objective the student achieved:

____ 1. Identified terms and definitions associated with the nature of matter.
____ *2. Described laws of electrical charges.
____ *3. Identified materials for conductors, insulators, and semi-conductors.
____ 4. Identified sources of electrical energy.

* Indicates core/essential objectives

COURSE: Electricity/Electronics I

Unit 3: D. C. Theory (9 weeks)

Objectives: Upon completion of this unit, the student will:

*1. Identify D. C. circuit terminology.
*2. Perform basic calculations using scientific notations.
*3. Measure resistance.
*4. Measure voltage.
*5. Measure current.
*6. Calculate circuit values using Ohm's law and power formula.
*7. Draw, calculate, construct, and measure a series circuit.
*8. Draw, calculate, construct, and measure a parallel circuit.
*9. Draw, calculate, construct, and measure a complex circuit.
10. Measure wire diameter or cross-sectional area and calculate resistance.
*11. Identify types of insulators for electrical conductors.
*12. Identify uses of D.C. motors, lights, etc.

*Indicates core/essential objectives

Suggested Instructional Practices:

Lecture - discussion
Laboratory demonstration and hands-on experience

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Evaluation and Suggested Minimum Performance Standards:

*Objective 1: The student will identify D. C. circuit terminology with 80% accuracy.
*Objective 2: The student will perform basic calculations using scientific notations with 80% accuracy.
*Objective 3: The student will measure resistance within one scale division.
*Objective 4: The student will measure voltage within one scale division.
*Objective 5: The student will measure current within one scale division.
*Objective 6: The student will calculate circuit values to 80% accuracy using Ohm's law and power formula.

*Objective 7: The student will draw, calculate, construct (corrected to 100%), and measure a series circuit within one scale deviation.

*Objective 8: The student will draw, calculate, construct (corrected to 100%), and measure a parallel circuit within one scale deviation.

*Objective 9: The student will draw, calculate, construct (corrected to 100%), and measure a complex circuit within one scale deviation.

Objective 10: The student will measure wire diameter or cross-sectional area to 100% accuracy using a wire gauge and calculate resistance to 80% accuracy.

*Objective 11: The student will identify five types of insulators for electrical conductors.

*Objective 12: The student will identify uses of D.C. motors, lights, etc. with 80% accuracy.

*Indicates core/essential objectives

Performance Record: Place a check by each objective the student achieved.

____ *1. Identified D. C. circuit terminology.
____ *2. Performed basic calculations using scientific notations.
____ *3. Measured resistance.
____ *4. Measured voltage.
____ *5. Measured current.
____ *6. Calculated circuit values using Ohm's law and power formula.
____ *7. Drew, calculated, constructed, and measured a series circuit.
____ *8. Drew, calculated, constructed, and measured a parallel circuit.
____ *9. Drew, calculated, constructed, and measured a complex circuit.
____ 10. Measured wire diameter or cross-sectional area and calculated resistance.
____ *11. Identified types of insulation for electrical conductors.
____ *12. Identified uses of D.C. motors, lights, etc.

*Indicates core/essential objectives

COURSE: Electricity/Electronics I

Unit 4: Magnetism and D. C. Motors (1 week)

Objectives: Upon completion of this unit, the student will:

1. Identify the terminology associated with magnetism.
2. Identify the terminology associated with D. C. motors.

Suggested Instructional Practices:

Lecture - discussion
Laboratory demonstration: Perform lab test on wrapping copper wire around nail to show pole.

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Evaluation and Suggested Minimum Performance Standards:

Objective 1: The student will identify the terminology associated with magnetism with 80% accuracy.
Objective 2: The student will identify the terminology associated with D. C. motors with 80% accuracy.

Performance Record: Place a check by each objective the student achieved.

____ 1. Identified terminology associated with magnetism.
____ 2. Identified terminology associated with D. C. motors.

COURSE: Electricity/Electronics I

Unit 5: A. C. Theory (10 weeks)

Objectives: Upon completion of this unit, the student will:

*1. Identify terminology associated with A. C.
*2. Identify terminology associated with A. C. generation.
*3. Identify terminology and formulas concerning transformers.
4. Identify and calculate the effects of inductive reactance.
*5. Identify terminology and formulas concerning capacitance.
6. Identify and calculate the effects of capacitive resistance.
7. Calculate R.C. and R.L. time constants.
*8. Draw and construct a series RCL circuit.
*9. Draw and construct a parallel RCL circuit.
10. Draw and use step up and step down transformers.
11. Identify and use a three phase power supply.
12. Convert power into horsepower using acceptable conversion methods.

*Indicates core/essential objectives

Suggested Instructional Practices:

Lecture - discussion
Laboratory demonstration and hands-on experience

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Evaluation and Suggested Minimum Performance Standards:

*Objective 1: The student will identify terminology concerning A.C. with 80% accuracy.
*Objective 2: The student will identify terminology concerning A.C. generation with 80% accuracy.
*Objective 3: The student will identify terminology and formulas concerning transformers with 80% accuracy.
Objective 4: The student will identify and calculate the effects of inductive reactance with 80% accuracy.
*Objective 5: The student will identify terminology and formulas concerning capacitance with 80% accuracy.
Objective 6: The student will identify and calculate the effects of capacitive resistance with 80% accuracy.

Objective 7: The student will calculate R.C. and R.L. time constants with 80% accuracy.

*Objective 8: The student will draw and construct a series RCL circuit corrected to 100% accuracy.

*Objective 9: The student will draw and construct a parallel RCL circuit corrected to 100% accuracy.

Objective 10: The student will draw and use a step up and step down transformer in a live circuit with 100% accuracy.

Objective 11: The student will identify and use a three phase power supply with 100% accuracy.

Objective 12: The student will invert power into horsepower using acceptable conversion methods (watts) with 100% accuracy.

*Indicates core/essential objectives

Performance Record: Place a check by each objective the student achieved:

____ *1. Identified terminology associated with A.C.
____ *2. Identified terminology associated with A.C. generation.
____ *3. Identified terminology and formulas concerning transformers.
____ 4. Identified and calculated the effects of inductive reactance.
____ *5. Identified terminology and formulas concerning capacitance.
____ 6. Identified and calculated the effects of capacitive resistance.
____ 7. Calculated R.C. and R.L. time constants.
____ *8. Drew and constructed a series RCL circuit.
____ *9. Drew and constructed a parallel RCL circuit.
____ 10. Drew and used a step up and step down transformer.
____ 11. Identified and used a three phase power supply.
____ 12. Converted power into horsepower using acceptable conversion methods.

*Indicates core/essential objectives

COURSE: Electricity/Electronics I

Unit 6: Soldering (2 weeks)

Objectives: Upon completion of this unit, the student will:

*1. Match soldering tools and materials with their uses.
*2. Solder and desolder various components and connectors.
*3. Describe cold solder joints.

*Indicates core/essential objectives

Suggested Instructional Practices:

Lecture - discussion
Laboratory demonstration and hands-on experience:
Troubleshoot a cold solder joint and use of flux.

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Evaluation and Suggested Minimum Performance Standards:

*Objective 1: The student will match soldering tools and materials with their uses with 80% accuracy.
*Objective 2: The student will solder and desolder a circuit containing a minimum of five components connectors and according to the instructor's worksheet.
*Objective 3: The student will describe a cold solder joint and its implications according to the instructor's work sheet.

*Indicates core/essential objectives

Performance Record: Place a check by each objective the student achieved.

____ *1. Matched soldering tools and materials with their uses.
____ *2. Soldered and desoldered a circuit of various components.
____ *3. Described a cold solder joint.

*Indicates core/essential objectives

ELECTRICITY/ELECTRONICS II

Developed by

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ELECTRICITY/ELECTRONICS II

Unit No.	Title
1	Orientation - Safety Review - Leadership
2	Solid State
3	Digital Electronics
4	Residential Wiring

COURSE: Electricity/Electronics II

Unit 1: Orientation - Safety Review - Leadership (2 weeks)

Objectives: Upon completion of this unit, the student will:

1. Distinguish between employer and employee expectations.

Suggested Instructional Practices:

Lecture - discussion
Laboratory practice

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Evaluation and Suggested Minimum Performance Standards:

Objective 1: The student will distinguish between employer and employee expectations to 80% accuracy using an instructor's job sheet.

Performance Record: Place a check by each objective the student achieved:

____ 1. Distinguished between employer and employee expectations.

COURSE: Electricity/Electronics II

Unit 2: Solid State (6 weeks)

Objectives: Upon completion of this unit, the student will:

*1. List the characteristics of semi-conductor materials.
*2. List the characteristics of a P.N. junction.
*3. Draw schematic diagram and waveforms of rectifier circuits, both full and half waves.
*4. Identify common filter networks.
*5. List applications of special semi-conductor diodes.
*6. Draw and label current flow of NPN and PNP transistors.
*7. Identify basic transistor circuit configurations.
*8. Identify basic classes of amplifiers.
*9. Identify basic requirements for an oscillator.

*Indicates core/essential objectives

Suggested Instructional Practices:

Lecture - discussion
Laboratory practice

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Evaluation and Suggested Minimum Performance Standards:

*Objective 1: The student will list the characteristics of semi-conductor materials with 80% accuracy.
*Objective 2: The student will list the characteristics of a P.N. junction with 80% accuracy.
*Objective 3: The student will draw schematic diagrams and waveforms of rectifier circuits, full and half wave, corrected to 100% accuracy.
*Objective 4: The student will identify three common filter networks.
*Objective 5: The student will list five applications of special semi-conductor diodes.
*Objective 6: The student will draw and label current flow of NPN and PNP transistors corrected to 100% accuracy.
*Objective 7: The student will identify three basic transistor circuit configurations.

*Objective 8: The student will identify two basic classes of amplifiers.

*Objective 9: The student will identify basic requirements for an oscillator corrected to 100% accuracy.

*Indicates core/essential objectives

Performance Record: Place a check by each objective the student achieved:

____ *1. Listed the characteristics of semi-conductor materials.
____ *2. Listed the characteristics of a P.N. junction.
____ *3. Drew schematic diagrams and waveforms of rectifier circuits, both full and half wave.
____ *4. Identified common filter networks.
____ *5. Listed applications of special semi-conductor diodes.
____ *6. Drew and labeled current flow of NPN and PNP transistors.
____ *7. Identified basic transistor circuit configurations.
____ *8. Identified basic classes of amplifiers.
____ *9. Identified basic requirements for an oscillator.

*Indicates core/essential objectives

COURSE: Electricity/Electronics II

Unit 3: Digital Electronics (6 weeks)

Objectives: Upon completion of this unit, the student will:

*1. Draw schematic symbols, gates, and truth tables for basic logic devices.
*2. Convert between number systems.
*3. Construct and measure inputs and outputs of various gates.
*4. Identify basic flip-flop circuits.
*5. Convert number systems base two and base sixteen to decimal.

*Indicates core/essential objectives

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I: Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Evaluation and Suggested Minimum Performance Standards:

*Objective 1: The student will draw schematic symbols (corrected to 100% accuracy) and three basic gates and truth tables for basic logic devices.
*Objective 2: The student will convert between number systems with 80% accuracy.
*Objective 3: The student will construct and measure inputs and outputs of various gates according to the instructor's work sheet.
*Objective 4: The student will identify two basic flip-flop circuits.
*Objective 5: The student will convert number systems base two and base sixteen to decimal with 100% accuracy.

*Indicates core/essential objectives

Performance Record: Place a check by each objective the student achieved:

____ *1. Drew schematic symbols, gates, and truth tables.
____ *2. Converted between number systems.
____ *3. Constructed and measured inputs and outputs of various gates.

___ *4. Identified basic flip-flop circuits.
___ *5. Converted number systems base two and base sixteen to decimal.

*Indicates core/essential objectives

COURSE: Electricity/Electronics II

Unit 4: Residential Wiring (13 weeks)

Objectives: Upon completion of this unit, the student will:

*1. Identify safety practices used in residential wiring.
*2. Select tools for use in residential wiring.
*3. Select materials from an electrical blueprint and calculate specifications.
*4. Wire residential circuits in accordance with National Electric Code and Shop Standards.
*5. Complete a load calculation sheet on a residence of specified size.
*6. Describe the differences between Fixed and Floating grounds (210 x 110).

*Indicates core/essential objectives

Suggested Resources:

Primary Resource: Hartman, Lonnie. Basic Electronics. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1987.

Robertson, L. Paul. Basic Electronics I:Revised Edition. Stillwater, OK: Mid-America Vocational Curriculum Consortium. 1982.

Secondary Resource: National Electric Code (Latest ed.)

Evaluation and Suggested Minimum Performance Standards:

*Objective 1: The student will identify safety practices used in residential wiring (corrected to 100%).
*Objective 2: The student will select tools for use in residential wiring from an instructor's work sheet.
*Objective 3: The student will select materials from an electrical blueprint and calculate specifications with a 70% accuracy.
*Objective 4: The student will wire residential circuits in accordance with National Electric Code and Shop Standards (corrected to 100% accuracy).
*Objective 5: The student will complete a load calculation sheet on a residence of specified size (corrected to 100% accuracy).

*Objective 6: The student will describe differences between Fixed and Floating grounds using a VOM with 80% accuracy.

*Indicates core/essential objectives

Performance Record: Place a check by each objective the student achieved:

____ *1. Identified safety practices used in residential wiring.
____ *2. Selected tools for use in residential wiring.
____ *3. Selected materials from an electrical blueprint and calculated specifications.
____ *4. Wired residential circuits in accordance with the National Electric Code and Shop Standards.
____ *5. Completed a load calculation sheet on a residence of specified size.
____ *6. Described the differences between Fixed and Floating grounds.

*Indicates core/essential objectives

STANDARD PERFORMANCE RECORD

ELECTRICITY/ELECTRONICS

ELECTRICITY/ELECTRONICS I

Student: _____

This record is provided as an alternative to the student performance records at the end of each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

Place a check by each objective the student achieved; you may wish to note the date that the student achieved the objective.

C = Core competencies

____ 1. Stated reasons why electricity/electronic fields are good areas for employment.
____ 2. Identified areas of employment opportunities.
____ 3. Identified responsibilities of students and teachers in the program.
____ C4. Matched terms and definitions associated with electrical safety.
____ C5. Stated hazards of working with electrical and electronic equipment.
____ 6. Identified the classes of fire and types of fire extinguishers.
____ C7. Identified general safety rules.
____ C8. Identified safety color codes.
____ 9. Stated procedures of leadership used to reach an agreement in an orderly manner.
____ 10. Selected the purposes of VICA.
____ 11. Identified the meaning of voltage and amperage.
____ 12. Selected minimum amperage that will prove fatal.
____ 13. Identified terms and definitions associated with the nature of matter.
____C14. Described laws of electrical charges.
____C15. Identified materials for conductors, insulators, and semi-conductors.
____ 16. Identified sources of electrical energy.
____C17. Identified D. C. circuit terminology.
____C18. Performed basic calculations using scientific notations.
____C19. Measured resistance.
____C20. Measured voltage.
____C21. Measured current.
____C22. Calculated circuit values using Ohm's law and power formula.
____C23. Drew, calculated, constructed, and measured a series circuit.
____C24. Drew, calculated, constructed, and measured a parallel circuit.
____C25. Drew, calculated, constructed, and measured a complex circuit.
____ 26. Measured wire diameter or cross-sectional area and calculated resistance.

____C27. Identified types of insulation for electrical conductors.
____C28. Identified uses of D.C. motors, lights, etc.
____ 29. Identified terminology associated with magnetism.
____ 30. Identified terminology associated with D. C. motors.
____C31. Identified terminology associated with A.C.
____C32. Identified terminology associated with A.C. generation.
____C33. Identified terminology and formulas concerning transformers.
____ 34. Identified and calculated the effects of inductive reactance.
____C35. Identified terminology and formulas concerning capacitance.
____ 36. Identified and calculated the effects of capacitive resistance.
____ 37. Calculated R.C. and R.L. time constants.
____C38. Drew and constructed a series RCL circuit.
____C39. Drew and constructed a parallel RCL circuit.
____ 40. Drew and used a step up and step down transformer.
____ 41. Identified and used a three phase power supply.
____ 42. Converted power into horsepower using acceptable conversion methods.
____C43. Matched soldering tools and materials with their uses.
____C44. Soldered and desoldered a circuit of various components.
____C45. Described a cold solder joint.

ELECTRICITY/ELECTRONICS II

Student: _____

This record is provided as an alternative to the student performance records at the end of each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

Place a check by each objective the student achieved; you may wish to note the date that the student achieved the objective.

C = Core competencies

____ 1. Distinguished between employer and employee expectations.
____ C2. Listed the characteristics of semi-conductor materials.
____ C3. Listed the characteristics of a P.N. junction.
____ C4. Drew schematic diagrams and waveforms of rectifier circuits, both full and half wave.
____ C5. Identified common filter networks.
____ C6. Listed applications of special semi-conductor diodes.
____ C7. Drew and labeled current flow of NPN and PNP transistors.
____ C8. Identified basic transistor circuit configurations.
____ C9. Identified basic classes of amplifiers.
____C10. Identified basic requirements for an oscillator.
____C11. Drew schematic symbols, gates, and truth tables.
____C12. Converted between number systems.
____C13. Constructed and measured inputs and outputs of various gates.
____C14. Identified basic flip-flop circuits.
____C15. Converted number systems base two and base sixteen to decimal.
____C16. Identified safety practices used in residential wiring.
____C17. Selected tools for use in residential wiring.
____C18. Selected materials from an electrical blueprint and calculated specifications.
____C19. Wired residential circuits in accordance with the National Electric Code and Shop Standards.
____C20. Completed a load calculation sheet on a residence of specified size.
____C21. Described the differences between Fixed and Floating grounds.